Package ‘TSE’

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Type Package
Title Total Survey Error
Version 0.1.0
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Note Package TSE works directly from the data set – no hand calculations required. Just upload a properly structured data set (see TESTNUMB and its documentation), properly input column names (see examples in the functions documentation), and run your functions.
Imports stats
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Calculates average mean absolute error (aMAE) for one or more surveys

**Usage**

`AVEMAE(Actuals1 = data.frame(), Observed1 = data.frame(), ...)`

**Arguments**

- `Actuals1` = data from a "gold standard" survey; objects are variable columns from "gold standard" survey that correspond to variable columns from `Observed1`
- `Observed1` = data from survey 1; objects are variable columns from survey 1 that correspond to variable columns from `Actuals1`
- `...` = "gold standard" data/survey # data for additional surveys

**Details**

aMAE for survey # => mean value of the MAEs for specified variables in survey # => mean value of MAEs for objects in `Observed#` = `data.frame()`

**Value**

Average mean absolute error (aMAE)

**Note**

Make sure to properly order inputs, per the example: `Actuals1`= `data.frame()` objects and corresponding `Observed1`= `data.frame()` objects must be given in the same order as each other; and `...` must be given in numbered pairs of `Actuals#`, `Observed#`, and those pairs given in sequence of their #s.
Examples

AVEMAE(Actuals1=data.frame(TESTNUMB$AQ1, TESTNUMB$AQ2),
      Observed1=data.frame(TESTNUMB$OQ1, TESTNUMB$OQ2),
      Actuals2=data.frame(TESTNUMB$AQ1, TESTNUMB$AQ2),
      Observed2=data.frame(TESTNUMB$OQ1, TESTNUMB$OQ2),
      Actuals3=data.frame(TESTNUMB$AQ1, TESTNUMB$AQ2),
      Observed3=data.frame(TESTNUMB$OQ1, TESTNUMB$OQ2))

Description

Calculates average mean absolute percentage error (aMAPE) for one or more surveys

Usage

AVEMAE(Actuals1 = data.frame(), Observed1 = data.frame(), ...)

Arguments

Actuals1 = data from a "gold standard" survey; objects are variable columns from "gold standard" survey that correspond to variable columns Observed1

Observed1 = data from survey 1; objects are variable columns from survey 1 that correspond to variable columns from Actuals1

... = "gold standard" data/survey # data for additional surveys

Details

aMAPE for survey # => mean value of the MAPEs for specified variables in survey # => mean value of MAPEs for objects in Observed# = data.frame()

Value

Average mean absolute percentage error (aMAPE)

Note

Make sure to properly order inputs, per the example: Actuals1 = data.frame() objects and corresponding Observed1 = data.frame() objects must be given in the same order as each other; and ... must be given in numbered pairs of Actuals#, Observed#, and those pairs given in sequence of their #s.
Examples

AVEMSEP(Actuals1=data.frame(TESTNUMB$AQ1, TESTNUMB$AQ2),
Observed1=data.frame(TESTNUMB$OQ1, TESTNUMB$OQ2),
Actuals2=data.frame(TESTNUMB$AQ1, TESTNUMB$AQ2),
Observed2=data.frame(TESTNUMB$OQ2, TESTNUMB$OQ2),
Actuals3=data.frame(TESTNUMB$AQ1, TESTNUMB$AQ2),
Observed3=data.frame(TESTNUMB$OQ3, TESTNUMB$OQ2))

AVEMSE

Calculate average mean squared error (aMSE) with bias-variance decomposition

Description

Calculates average mean squared error (aMSE) with bias-variance decomposition for one or more surveys

Usage

AVEMSE(Actuals1 = data.frame(), Observed1 = data.frame(), ...)

Arguments

Actuals1 = data from a "gold standard" survey; objects are variable columns from "gold standard" survey that correspond to variable columns Observed1
Observed1 = data from survey 1; objects are variable columns from survey 1 that correspond to variable columns from Actuals1
... = "gold standard" data/survey # data for additional surveys

Details

aMSE for survey # => mean value of the MSEs for specified variables in survey # => mean value of MSEs for objects in Observed# = data.frame()

Value

Average mean squared error (aMSE) with bias-variance decomposition

Note

Make sure to properly order inputs, per the example: Actuals1=data.frame() objects and corresponding Observed1=data.frame() objects must be given in the same order as each other; and ... must be given in numbered pairs of Actuals#, Observed#, and those pairs given in sequence of their #s.
AVEMSLE

Examples

AVEMSE(Actuals1=data.frame(TESTNUMBS$AQ1, TESTNUMBS$AQ2),
         Observed1=data.frame(TESTNUMBS$01Q1, TESTNUMBS$01Q2),
         Actuals2=data.frame(TESTNUMBS$AQ1, TESTNUMBS$AQ2),
         Observed2=data.frame(TESTNUMBS$02Q1, TESTNUMBS$02Q2),
         Actuals3=data.frame(TESTNUMBS$AQ1, TESTNUMBS$AQ2),
         Observed3=data.frame(TESTNUMBS$03Q1, TESTNUMBS$03Q2))

AVEMSLE

Calculate average mean squared logarithmic error (aMSLE)

Description

Calculates average mean squared logarithmic error (aMSLE) for one or more surveys

Usage

AVEMSLE(Actuals1 = data.frame(), Observed1 = data.frame(), ...)

Arguments

Actuals1 = data from a "gold standard" survey; objects are variable columns from "gold standard" survey that correspond to variable columns Observed1

Observed1 = data from survey 1; objects are variable columns from survey 1 that correspond to variable columns from Actuals1

... = "gold standard" data/survey # data for additional surveys

Details

aMSLE for survey # => mean value of the MSLEs for specified variables in survey # => mean value of MSLEs for objects in Observed# = data.frame()

Value

Average mean squared logarithmic error (aMSLE)

Note

Make sure to properly order inputs, per the example: Actuals1=data.frame() objects and corresponding Observed1=data.frame() objects must be given in the same order as each other; and ... must be given in numbered pairs of Actuals#, Observed#, and those pairs given in sequence of their #s.
Examples

`AVEMSLQE(ActualsQ = data.frame(TESTNUMB$AQ1, TESTNUMB$AQ2),
    ObservedQ = data.frame(TESTNUMB$OQ1, TESTNUMB$OQ2),
    ActualsR = data.frame(TESTNUMB$AR1, TESTNUMB$AR2),
    ObservedR = data.frame(TESTNUMB$OR1, TESTNUMB$OR2),
    ActualsS = data.frame(TESTNUMB$AS1, TESTNUMB$AS2))

Description

Calculates average relative absolute error (aRAE) for one or more surveys

Usage

`AVERAE(Actuals1 = data.frame(), Observed1 = data.frame(), ...)

Arguments

- `Actuals1` = data from a "gold standard" survey; objects are variable columns from "gold standard" survey that correspond to variable columns `Observed1`
- `Observed1` = data from survey 1; objects are variable columns from survey 1 that correspond to variable columns from `Actuals1`
- `...` = "gold standard" data/survey # data for additional surveys

Details

- aRAE for survey # => mean value of the RAES for specified variables in survey # => mean value of RAES for objects in `Observed#=data.frame()

Value

Average relative absolute error (aRAE)

Note

Make sure to properly order inputs, per the example: `Actuals1=data.frame()` objects and corresponding `Observed1=data.frame()` objects must be given in the same order as each other; and ... must be given in numbered pairs of `Actuals#`, `Observed#`, and those pairs given in sequence of their #s.
AVERMSE

Examples

```
AVERAGE(Actuals1=data.frame(TESTNUMBS$A1Q, TESTNUMBS$A2Q),
Observed1=data.frame(TESTNUMBS$O1Q, TESTNUMBS$O2Q),
Actuals2=data.frame(TESTNUMBS$A3Q, TESTNUMBS$A4Q),
Observed2=data.frame(TESTNUMBS$O3Q, TESTNUMBS$O4Q),
Actuals3=data.frame(TESTNUMBS$A5Q, TESTNUMBS$A6Q),
Observed3=data.frame(TESTNUMBS$O5Q, TESTNUMBS$O6Q))
```

AVERMSE

Calculate average root mean squared error (aRMSE)

Description

Calculates average root mean squared error (aRMSE) for one or more surveys

Usage

```
AVERMSE(Actuals1 = data.frame(), Observed1 = data.frame(), ...)
```

Arguments

- `Actuals1` = data from a "gold standard" survey; objects are variable columns from "gold standard" survey that correspond to variable columns Observed1
- `Observed1` = data from survey 1; objects are variable columns from survey 1 that correspond to variable columns from Actuals1
- ...

Details

aRMSE for survey # => mean value of the RMSEs for specified variables in survey # => mean value of RMSEs for objects in Observed#=data.frame()

Value

Average root mean squared error (aRMSE)

Note

Make sure to properly order inputs, per the example: Actuals1=data.frame() objects and corresponding Observed1=data.frame() objects must be given in the same order as each other; and ...

must be given in numbered pairs of Actuals#, Observed#, and those pairs given in sequence of their #s.
Examples

AVERMSLE(Actuals1 = data.frame(TESTNUMB$A0Q1, TESTNUMB$A0Q2),
Observed1 = data.frame(TESTNUMB$O0Q1, TESTNUMB$O0Q2),
Actuals2 = data.frame(TESTNUMB$A0Q1, TESTNUMB$A0Q2),
Observed2 = data.frame(TESTNUMB$O0Q1, TESTNUMB$O0Q2),
Actuals3 = data.frame(TESTNUMB$A0Q1, TESTNUMB$A0Q2),
Observed3 = data.frame(TESTNUMB$O0Q1, TESTNUMB$O0Q2))

AVERMSLE

Calculate average root mean squared logarithmic error (aRMSLE)

Description

Calculates average root mean squared logarithmic error (aRMSLE) for one or more surveys

Usage

AVERMSLE(Actuals1 = data.frame(), Observed1 = data.frame(), ...)

Arguments

Actuals1 = data from a "gold standard" survey; objects are variable columns from "gold
standard" survey that correspond to variable columns Observed1

Observed1 = data from survey 1; objects are variable columns from survey 1 that cor-
respond to variable columns from Actuals1

... = "gold standard" data/survey # data for additional surveys

Details

aRMSLE for survey # => mean value of the RMSLEs for specified variables in survey # => mean
value of RMSLEs for objects in Observed# = data.frame()

Value

Average root mean squared logarithmic error (aRMSLE)

Note

Make sure to properly order inputs, per the example: Actuals1 = data.frame() objects and cor-
responding Observed1 = data.frame() objects must be given in the same order as each other; and
... must be given in numbered pairs of Actuals#, Observed#, and those pairs given in sequence of
their #s.
AVERRSE

Examples

AVERRSE(Actuals1=data.frame(TSTNUMB$A01, TSTNUMB$A02),
          Observed1=data.frame(TSTNUMB$O01Q1, TSTNUMB$O01Q2),
          Actuals2=data.frame(TSTNUMB$A01, TSTNUMB$A02),
          Observed2=data.frame(TSTNUMB$O02Q1, TSTNUMB$O02Q2),
          Actuals3=data.frame(TSTNUMB$A01, TSTNUMB$A02),
          Observed3=data.frame(TSTNUMB$O03Q1, TSTNUMB$O03Q2))

AVERRSE   Calculate average root relative squared error (aRRSE)

Description

Calculates average root relative squared error (aRRSE) for one or more surveys

Usage

AVERRSE(Actuals1 = data.frame(), Observed1 = data.frame(), ...)

Arguments

Actuals1 = data from a "gold standard" survey; objects are variable columns from "gold standard" survey that correspond to variable columns Observed1

Observed1 = data from survey 1; objects are variable columns from survey 1 that correspond to variable columns from Actuals1

... = "gold standard" data/survey # data for additional surveys

Details

aRRSE for survey # => mean value of the RRSEs for specified variables in survey # => mean value of RRSEs for objects in Observed# = data.frame()

Value

Average root relative squared error (aRRSE)

Note

Make sure to properly order inputs, per the example: Actuals1=data.frame() objects and corresponding Observed1=data.frame() objects must be given in the same order as each other; and ...
... must be given in numbered pairs of Actuals#, Observed#, and those pairs given in sequence of their #s.
**Examples**

```r
AVERRSE(Actuals1=data.frame(TESTNUMB$A01, TESTNUMB$A02),
         Observed1=data.frame(TESTNUMB$O01, TESTNUMB$O02),
         Actuals2=data.frame(TESTNUMB$A01, TESTNUMB$A02),
         Observed2=data.frame(TESTNUMB$O02, TESTNUMB$O02),
         Actuals3=data.frame(TESTNUMB$A01, TESTNUMB$A02),
         Observed3=data.frame(TESTNUMB$O03, TESTNUMB$O03))
```

---

**AVERRSE**  
*Calculate average relative squared error (aRSE)*

**Description**

Calculates average relative squared error (aRSE) for one or more surveys

**Usage**

```r
AVERRSE(Actuals1 = data.frame(), Observed1 = data.frame(), ...)
```

**Arguments**

- `Actuals1` = data from a "gold standard" survey; objects are variable columns from "gold standard" survey that correspond to variable columns Observed1
- `Observed1` = data from survey 1; objects are variable columns from survey 1 that correspond to variable columns from Actuals1
- `...` = "gold standard" data/survey # data for additional surveys

**Details**

aRSE for survey # => mean value of the RSEs for specified variables in survey # => mean value of RSEs for objects in Observed# = data.frame()

**Value**

Average relative squared error (aRSE)

**Note**

Make sure to properly order inputs, per the example: Actuals1=data.frame() objects and corresponding Observed1=data.frame() objects must be given in the same order as each other; and ... must be given in numbered pairs of Actuals#, Observed#, and those pairs given in sequence of their #s.
AVESMAPE

Examples

AVESMAPE(Actuals1=data.frame(TESTNUMBS$AQ1, TESTNUMBS$AQ2),
          Observed1=data.frame(TESTNUMBS$OQ1, TESTNUMBS$OQ2),
          Actuals2=data.frame(TESTNUMBS$AQ1, TESTNUMBS$AQ2),
          Observed2=data.frame(TESTNUMBS$OQ2, TESTNUMBS$OQ2),
          Actuals3=data.frame(TESTNUMBS$AQ1, TESTNUMBS$AQ2),
          Observed3=data.frame(TESTNUMBS$OQ3, TESTNUMBS$OQ3))

AVESMAPE

Calculate average symmetric mean absolute percentage error (aSMAPE)

Description

Calculates average symmetric mean absolute percentage error (aSMAPE) for one or more surveys

Usage

AVESMAPE(Actuals1 = data.frame(), Observed1 = data.frame(), ...)

Arguments

Actuals1 = data from a "gold standard" survey; objects are variable columns from "gold
standard" survey that correspond to variable columns Observed1

Observed1 = data from survey 1; objects are variable columns from survey 1 that cor-
respond to variable columns from Actuals1

... = "gold standard" data/survey # data for additional surveys

Details

aSMAPE for survey # => mean value of the SMAPEs for specified variables in survey # => mean
value of SMAPEs for objects in Observed# = data.frame()

Value

Average symmetric mean absolute percentage error (aSMAPE)

Note

Make sure to properly order inputs, per the example: Actuals1=data.frame() objects and cor-
responding Observed1=data.frame() objects must be given in the same order as each other; and
... must be given in numbered pairs of Actuals#, Observed#, and those pairs given in sequence of
their #s.
Examples

```r
AVESEMAPE(Actuals1=data.frame(TESTNUMB$A01Q1, TESTNUMB$A02Q2),
Observed1=data.frame(TESTNUMB$O01Q1, TESTNUMB$O01Q2),
Actuals2=data.frame(TESTNUMB$A01Q1, TESTNUMB$A02Q2),
Observed2=data.frame(TESTNUMB$O02Q1, TESTNUMB$O02Q2),
Actuals3=data.frame(TESTNUMB$A01Q1, TESTNUMB$A02Q2),
Observed3=data.frame(TESTNUMB$O03Q1, TESTNUMB$O03Q2))
```

**FULLSD**

*Calculate full scale-dependent statistics*

**Description**

Calculates full scale-dependent statistics for one or more surveys

**Usage**

```r
FULLSD(Actuals1 = data.frame(), Observed1 = data.frame(), ...)
```

**Arguments**

- `Actuals1` = data from a "gold standard" survey; objects are variable columns from "gold standard" survey that correspond to variable columns `Observed1`
- `Observed1` = data from survey 1; objects are variable columns from survey 1 that correspond to variable columns from `Actuals1`
- `...` = "gold standard" data/survey # data for additional surveys

**Value**

Full scale-dependent statistics

**Note**

Make sure to properly order inputs, per the example: `Actuals1=data.frame()` objects and corresponding `Observed1=data.frame()` objects must be given in the same order as each other; and ... must be given in numbered pairs of `Actuals#`, `Observed#`, and those pairs given in sequence of their #s.

**Examples**

```r
FULLSD(Actuals1=data.frame(TESTNUMB$A01Q1, TESTNUMB$A02Q2),
Observed1=data.frame(TESTNUMB$O01Q1, TESTNUMB$O01Q2),
Actuals2=data.frame(TESTNUMB$A01Q1, TESTNUMB$A02Q2),
Observed2=data.frame(TESTNUMB$O02Q1, TESTNUMB$O02Q2),
Actuals3=data.frame(TESTNUMB$A01Q1, TESTNUMB$A02Q2),
Observed3=data.frame(TESTNUMB$O03Q1, TESTNUMB$O03Q2))
```
FULLSI

Calculate full scale-independent statistics

Description

Calculates full scale-independent statistics for one or more surveys

Usage

FULLSI(Actuals1 = data.frame(), Observed1 = data.frame(), ...)

Arguments

Actuals1 = data from a "gold standard" survey; objects are variable columns from "gold standard" survey that correspond to variable columns Observed1

Observed1 = data from survey 1; objects are variable columns from survey 1 that correspond to variable columns from Actuals1

... = "gold standard" data/survey # data for additional surveys

Value

Full scale-independent statistics

Note

Make sure to properly order inputs, per the example: Actuals1=data.frame() objects and corresponding Observed1=data.frame() objects must be given in the same order as each other; and ... must be given in numbered pairs of Actuals#, Observed#, and those pairs given in sequence of their #s.

Examples

FULLSI(Actuals1=data.frame(TESTNUMB$AQ1, TESTNUMB$AQ2), Observed1=data.frame(TESTNUMB$O1Q1, TESTNUMB$O1Q2), Actuals2=data.frame(TESTNUMB$AQ1, TESTNUMB$AQ2), Observed2=data.frame(TESTNUMB$O2Q1, TESTNUMB$O2Q2), Actuals3=data.frame(TESTNUMB$AQ1, TESTNUMB$AQ2), Observed3=data.frame(TESTNUMB$O3Q1, TESTNUMB$O3Q2))
Description

A data set created by merging four smaller data sets. Three of those smaller data sets are data from three surveys (O1, O2, O3); the other is data from a "gold standard" survey (A1). All four smaller data sets consist of the same three variables (Q1, Q2, Q3): responses to the same three questions, asked by each survey from the same 10 respondents (ID), along the same 1-99 response scale.

Usage

TESTNUMB

Format

A data frame with 10 rows and 13 variables

ID, AQ1, AQ2, AQ3, O1Q1, O1Q2, O1Q3, O2Q1, O2Q2, O2Q3, O3Q1, O3Q2, O3Q3 sets of three variables from each of four surveys, merged together

Source

Example data generated by author
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